



Grid Consulting Services

Illustration of SuperGrid Institute know-how & tools

1. HV/MV GRID STUDIES

Main applications: HVDC grids, MVDC grids, Offshore Wind farm (“OWF”) grid connections.

This non-exhaustive list is given for information only, please contact us for any grid studies request and we will be glad to help.

Category	Description	Project stage
Planning & CBA	Macro studies (Adequacy – Production / Demand...) Type of connection technology (AC/DC)	Feasibility study Concept design
Basis of design	Single line diagrams Cabling layout (OWF) Voltage selection Technology choices Techno-economic analysis (TEA) studies	Feasibility study Concept design
Grid connection (OWF)	Concept studies Local connection feasibility Risk of curtailment (grid impact)	Feasibility study Concept design
Grid impact	Load flow Fault level analysis Contingencies Transient analysis Dynamic analysis	Feasibility study Concept design
Grid code compliance / System studies	PQ and UQ capability diagrams Dynamic and transient stability Fault ride through capability Voltage and frequency regulation Harmonic analysis	Concept design FEED
Detailed design	Load flow (power transformers & reactors sizing) Fault level analysis <ul style="list-style-type: none"> Specifications of component short circuit withstand (cable, switchboards, cells, circuit breakers...) Sizing of the earthing transformer of the substation based on calculated capacitive current at MV level Contingencies Dynamic analysis Transient analysis Harmonics study Neutral grounding & earthing study Protection coordination <ul style="list-style-type: none"> Specification of ANSI protection functions for the substation in compliance with TSO + CT/VT calibration. Insulation coordination study (Surge arrester sizing) Models (EMTP-RV)	FEED
Equipment specification (review & validation)	MV/HV equipment selection Definition of sensors Equipment V / I constraints checking	FEED
Energy yield analysis	Net average energy yield Uncertainty analysis (incl. P50 - P90 range) Detailed reporting Financial impact	Technical due diligence
Financial analysis	CAPEX/OPEX modelling & evaluation Cash flow modelling	Technical due diligence

2. SOFTWARES & TOOLS

Software	Category addressed	Type	Status	
OpTEAssoft Wind	OWF Basis of design (Techno-economic modelling and optimization software for OWF grid connections) Energy yield analysis	In-house	Available	
EMTP-RV	Grid connection Grid impact Grid code compliance/ System studies Detailed design	Powersys	Ver 4.0	
PSCAD		Manitoba Hydro International Ltd.	V4.6.3	
PSS/E		Siemens	V33	
Simscape Power Systems		The MathWorks, Inc	2019b	
Matlab Simulink		Dassault Systèmes	2019	
Dymola		Open source	1.13.2 and 1.14 dev	
OpenModelica		Opal-RT Technologies, Inc	6.x and 2019.2	
Hypersim		Detailed design		